

Diversity of local pig breeds and production systems for high quality traditional products and sustainable pork chains (TREASURE): project presentation

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ABSTRACT: Project proposes research and development activities for the benefit of sustainable pork chains based on European local pig breeds and their production systems. Work programme is planned to respond to consumer demands for quality and healthiness of pork products with regional identity and societal demands for environment preservation and development of local agro-economy. Description and evaluation of local pig breeds, with an emphasis on untapped ones will be performed using novel genomic tools. Performance of local pig breeds will be evaluated in contrasted agro-geo-climatic conditions and production systems (indoor, outdoor, organic). Focus will be on pig feeding and management strategies and on the use of locally available feeding resources. Intrinsic quality of traditional and new regional high quality pork products and attitudes of consumers from various market areas will be assessed; in particular the motives for the choice and willingness to pay such products. Marketing strategies will be addressed in particular short chain distribution channels. All activities will be driven from the perspective of sustainability (environmental impact, animal welfare, product quality, consumer acceptability and market potential). The activities will engage innovative approaches to answer socio-economic demands of regional pork chains involving partners from different sectors. The ambition is to enhance existing and create new networks between academia and non-academia partners, within and between regions and to tackle the value chain for regional high quality pork products, focusing on diverse and so far untapped pig breeds, their production systems and pork products. Cross-fertilising interactions between research, local agriculture, businesses and end-users will be achieved with partners from these complementary sectors in all research and development activities.

Key words: local pig breeds, traditional pork chains; product quality; sustainability

INTRODUCTION

The TREASURE project is financed as Research and Innovation action under the European programme Horizon 2020 (grant agreement 634476). The consortium of 25 partners from 9 countries (Figure 1) has been granted in the frame of the call “Traditional resource for agricultural diversity and the food chain (SFS-07a-2014)”. The project started on the 1st of April 2015 and will last 48 months. The aim of the project is to improve the knowledge, skills and competences necessary to develop existing and create new sustainable pork chains based on European local pig genetic resources (local breeds), which correspond to the highest consumer demands for quality and healthiness of pork products, and to the societal demands regarding animal welfare, environment and rural development.



Figure 1: Partners of TREASURE project

Nowadays the public opinion in Europe is not very favourable to intensive pig production which faces animal welfare and environmental problems (Kanis et al, 2003). In many European regions, intensive pig production chains are no longer sustainable and are facing a decline in pig production and in self-provision. It is estimated that one third of the global cereal production is used to feed animals, and pigs as omnivores are directly concurrent to human population for available crops (FAO, 2006). It can be expected that in the future, the sustainability of pig production systems will depend on the locally available feeding resources (Godfray et al., 2010), which vary from region to region, due to contrasted geo-agro-climatic conditions. Local pig breeds are adapted to specific local environments and fed various locally available feedstuffs. So, besides their genetic merit for agro-biodiversity, they represent the basis for sustainable local pork chains, especially important for the regions where available arable land and/or cereal production is limited (Herrero et al., 2009). Contrary to intensive pig production, local pig breeds and their respective production systems are able

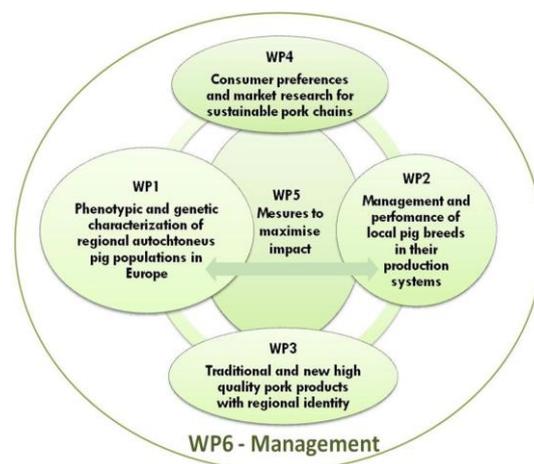
to respond to the high criteria and expectations of modern society in regard to some environmental aspects (including forest management and landscape conservation; Lopez-Bote 1998, Edwards 2005, Dourmad and Casabianca 2013), animal welfare, food quality and healthiness (Verbeke et al., 2010). Traditional pork products represent often culinary heritage of the regions and have an excellent image by consumers due to typical quality attributes, which cannot be assured with pigs from conventional intensive husbandry (Bonneau & Lebret, 2010). Few cases of successful local breed chains exist in Europe and the vast majority of them remain an untapped potential. In terms of scientific substantiation, their performances and products are practically untapped and market potential of their products unexploited.

OUTLINE OF THE PROJECT

The inherent value of European local pig breeds and productions systems represent not only the exceptional agricultural biodiversity but are also prerequisite for the unique regional high quality pork products. In many cases such products are part of culinary heritage and/or belong to a category of special quality (e.g. organic, PDO, PGI, TSG) for which there is increasing consumer demand. In order to improve the supply of the markets with such pork products, activities on research, innovation and knowledge transfer are needed. Objectives shall be reached through teaming of partners from research with real sector, advisory services (local technical institutes or Chambers of agriculture) and end-users (farmers, consumers, policy makers) and by creation of functional network of stakeholders in pork chains based on local pig breeds from North to South of Europe. By promoting these systems, societal demands for local self-provision, short distribution chains, diversified agricultural activities, animal welfare and environment can be fulfilled. In a broader societal perspective better exploitation of locally available agro-resources (genetic and feed) contributes to the preservation of rural environment and landscape, viability of rural areas, as a foundation for economic growth of regional agro-food sector.

Main objectives of the project are:

- Analyse the phenotypic and functional properties encompassed in local pig genetic resources (breeds), especially the untapped ones, and develop DNA tools for authentication, traceability, conservation and breeding programmes. In addition, together with WP2, study gene expression in relation to innovative rearing practices (activities under WP1).
- Acquire knowledge on pig nutritional requirements, use of locally available feeding resources, innovative feeding and management strategies and environmental impacts of pig production systems (activities under WP2).
- Build up quality/healthiness attributes of regional pork products in line with consumer demands including innovations in traditional products to meet healthy requirements (e.g. salt reduction), and identify links between intrinsic qualities of pork products and pig production systems (activities under WP3).



- Perform a cost/benefit analysis at different levels of the chain and for the society, and research of market potential and strategies for regional high quality products (activities under WP4).
- Transfer/exchange of knowledge and expertise among partners, dissemination to end-users and general public. Creation of functional networks within and between different regions or sectors and the creation of a new (umbrella) collective trademark for meat and products from local pig breeds (activities under WP5).

The key challenge of TREASURE is to contribute to the development of sustainable pork chains in geo-agro-climatically contrasted regions of Europe by promoting the biodiversity treasure encompassed in European local pig breeds. The project is based on the holistic approach by covering all the aspects important for the sustainability of pork chain, from feeding resource, inherent genetic potential of local pig breeds, feeding and management strategies, product fabrication and evaluation till product marketing; consequently diversified competences of partners and trans-disciplinary strategy in research are required.

The overall concept of the project is based on the development of pork chains which are more extensive with better utilisation of locally available feed resources and using local pig breeds. Besides their biodiversity merit, local pig breeds provide products with special sensory quality and regional identity searched by consumers (Guerrero et al., 2010). With few exceptions, local pig breeds (Table 2) are unexploited and often endangered. Their preservation depends on the incomes from farming activities, and by developing sustainable pork chains, local pig breeds would no longer be endangered. However, as their productivity is lower, production chains can become sustainable only when their genetic potential is optimally used, production systems optimised and their products are viable on the market which shall be addressed in the present project. To improve market potential of high quality products from local pig breeds it is essential to gain scientific proofs of their singularity, productivity and product quality, as well as develop traceability/authentication tools and to perform relevant assessments of local feed resources, management practices, impact for environment and consumer acceptability, and marketing strategies adapted to regional circumstances.

Country	Native name for pig/breed
DE	Schwäbisch-Hällisches
ES	Ibérico
ES	Negre Mallorquí
FR	Gascon
FR	Basque
HR	Crna slavonska
HR	Turopoljska
IT	Cinta Senese
IT	Mora Romagnola
IT	Sarda
IT	Apulo Calabrese
IT	Casertana
IT	Nero Siciliano
LT	Lietuvos vietinës
LT	Senojo tipo Lietuvos baltosios
PT	Bisaro/Bisara
PT	Alentejano/Alentejana
RS	Mangulica
RS	Moravka
SI	Krškopoljski/ Krškopolje

Table 2: List of local pig breeds studied in the project

The project is built on the inherent value encompassed in local pig breeds, their production systems and product qualities with the idea of new paradigm of pig production that meets

societal demands regarding environment, genetic diversity, ethical and social aspects and economic value. Many local pig breeds/systems and consequently partners are involved in the project, from academia and non-academia, public and real sector. It is important to note that TREASURE puts the emphasis on the untapped local pig breeds and products from different European regions. Nevertheless, partners from the regions with already established examples of successful pork chains will be engaged. On one hand, these chains have a need for further developments, and on the other hand, their experience and “know-how” in establishing functional and sustainable chains can be transferred to partners/regions where local breed pork chains are at start-up stage of development.

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